



DARPA/USAF

Unmanned Combat Air Vehicle

Advanced Technology Demonstration

Overview of Program

Public Release Briefing
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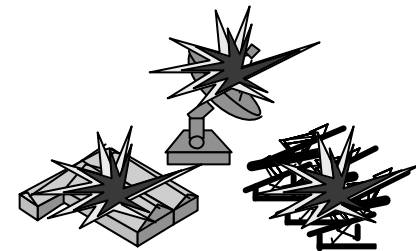
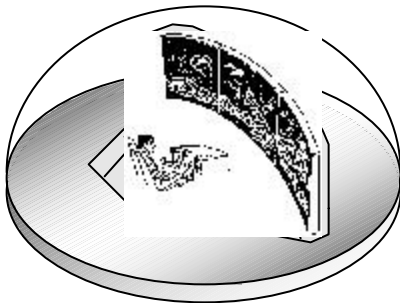
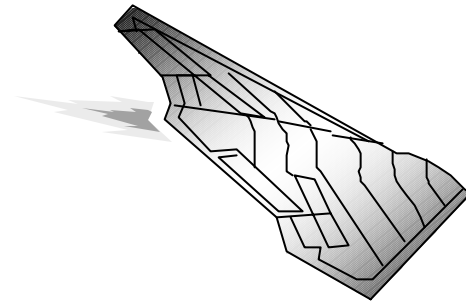
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Overview



- **Video**
- **Vision, Objectives & Approach**
- **Effectiveness**
- **Expected Results**



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INSERT VIDEO HERE



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UCAV Vision



- **Revolutionary New Tactical Airpower**

- Force Enabler - Preemptive and Reactive SEAD
- Provide Persistent All Weather Strike Capability
- Augment Manned Force Structure
- New CONOPS for High Risk or High Payoff Missions

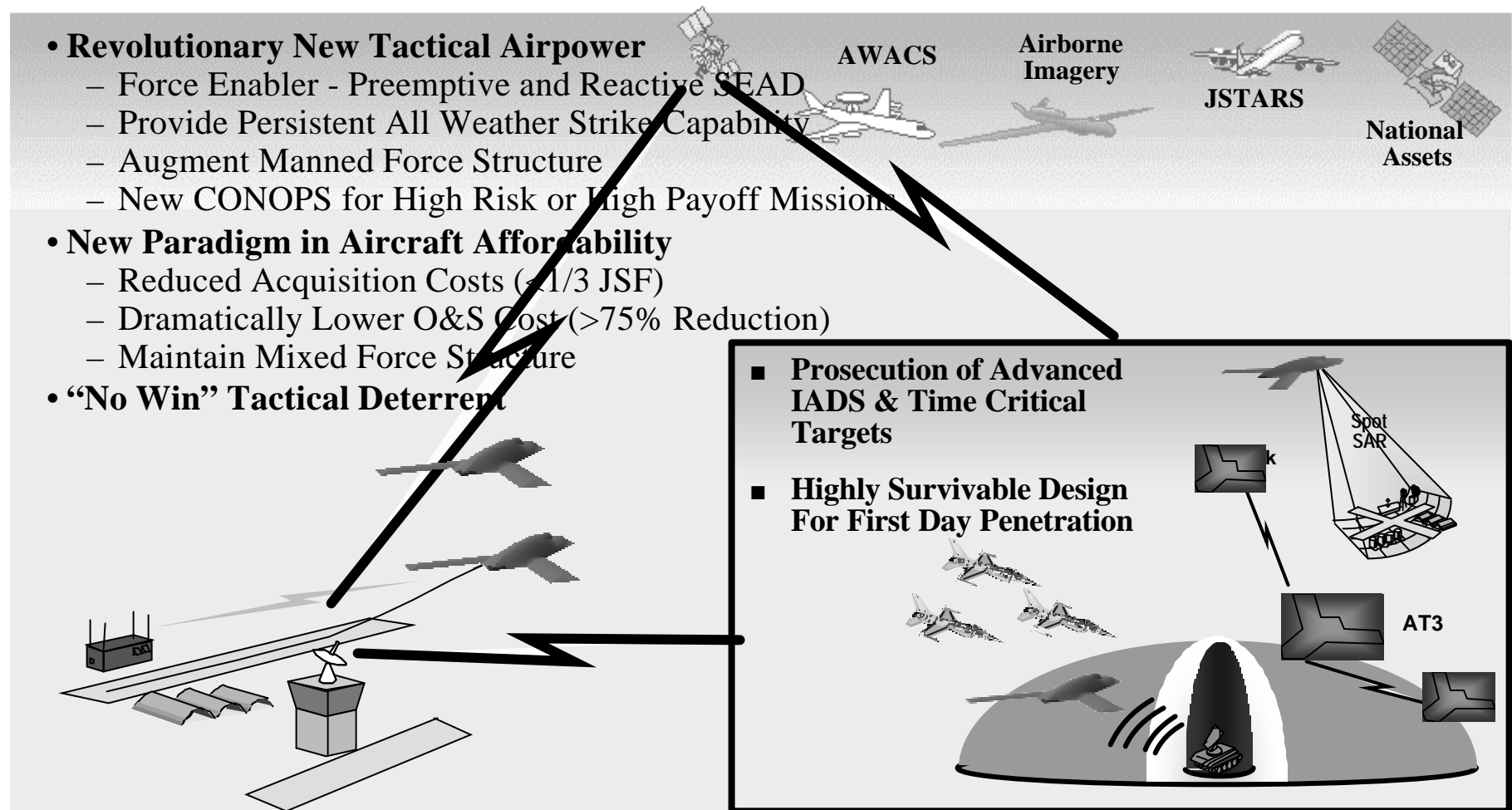
- **New Paradigm in Aircraft Affordability**

- Reduced Acquisition Costs (<1/3 JSF)
- Dramatically Lower O&S Cost (>75% Reduction)
- Maintain Mixed Force Structure

- **“No Win” Tactical Deterrent**

- **Prosecution of Advanced IADS & Time Critical Targets**

- **Highly Survivable Design For First Day Penetration**



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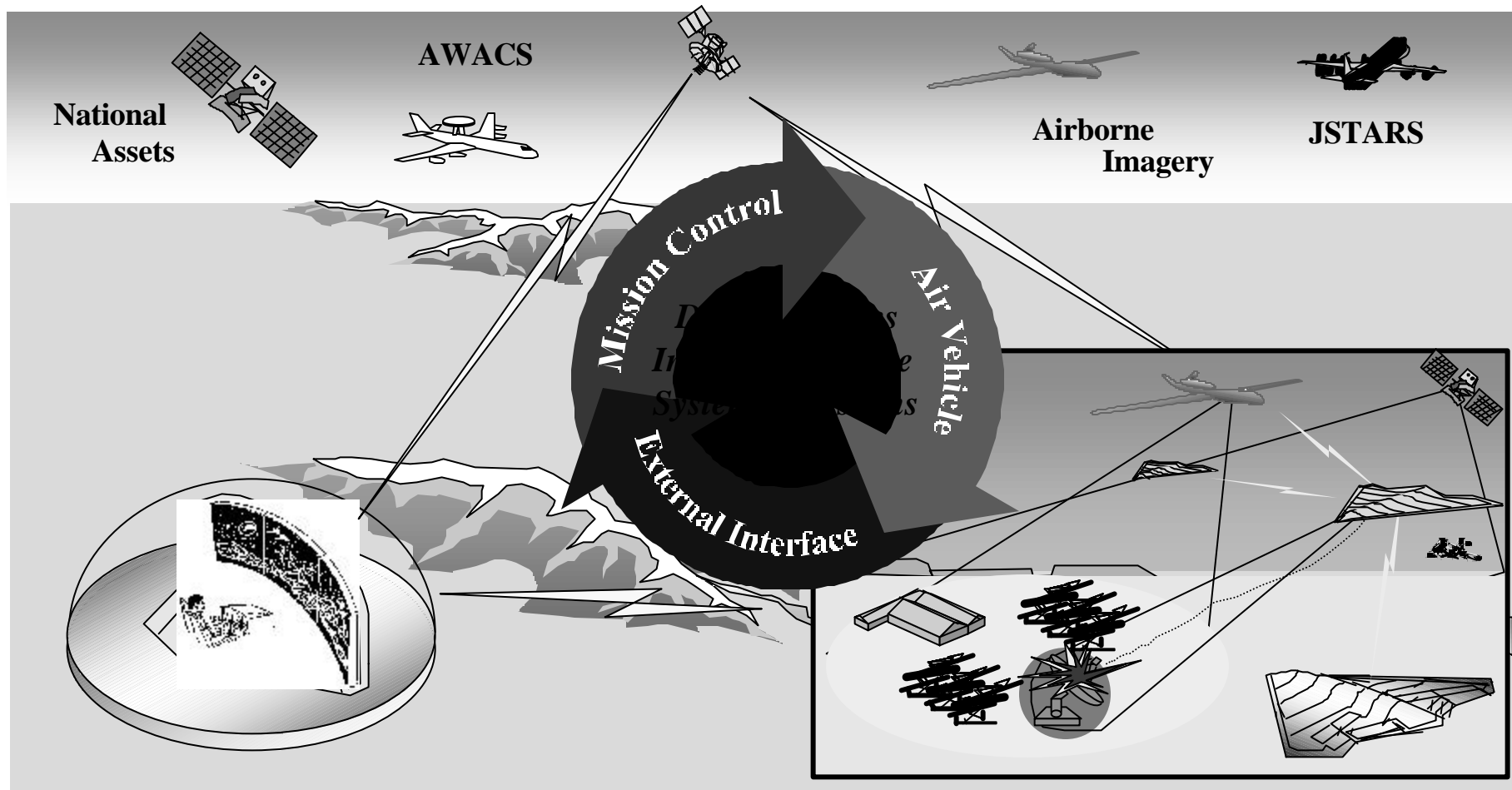
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System Concept



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Goal & Objectives



Demonstrate the technical feasibility for a UCAV system to effectively and affordably prosecute 21st century SEAD/Strike missions within the emerging global command and control architecture.

- **Develop**
 - a low life-cycle cost, mission effective design for a SEAD/Strike unmanned air vehicle
 - a re-configurable control station for multi-ship ops
 - robust/secure command, control & communications, LOS & BLOS
- **Evaluate**
 - human computer function allocation, dynamic mission planning & management approaches
 - off-board/on-board sensor integration, weapon targeting & loadouts
- **Demonstrate**
 - human-in-the-loop; detection, identification, location, real-time targeting, weapons authorization, weapons delivery and target damage indication.
- **Continue refinement & assessment of operational SEAD/Strike UCAV design**



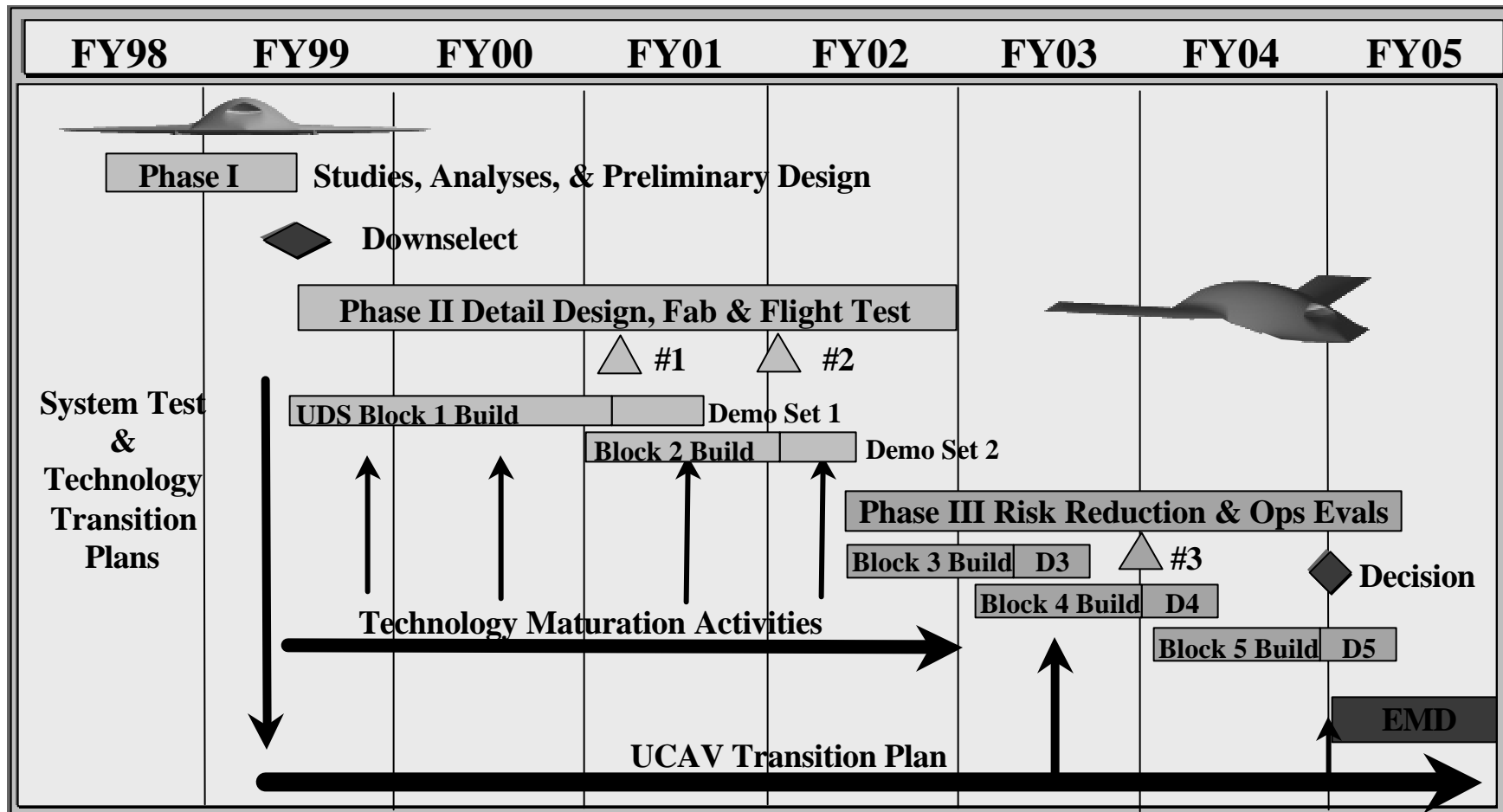
Program Philosophy



- **Partnership to Demo Technical Feasibility**
 - **Section 845 Agreement**
 - **Government - WHATS**
 - **Industry - HOWS**
- **Exploit Design Freedom - Think out of the Box**
- **Threat Driven Process**
- **Focused on SEAD/Strike force enabler concept**
- **ATD *NOT* ACTD**
- **Clearly Defined Roadmaps to Potential AOA Decision**
- **Provide Focus for S&T**



UCAV Acquisition Strategy





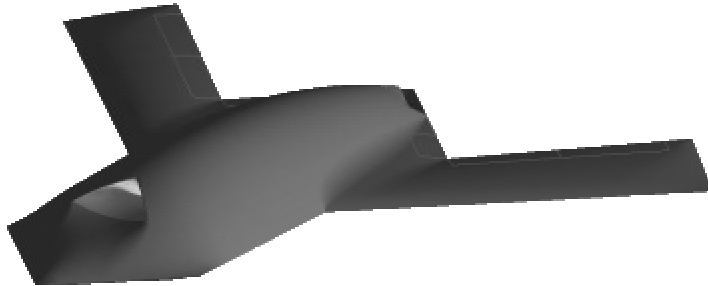
Phase I Affordability Results



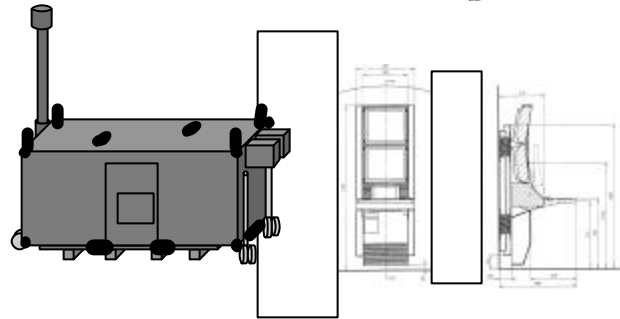
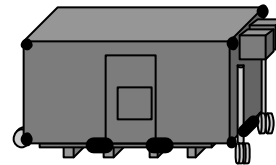
- **Acquisition Cost < 1/3 JSF**
 - Includes MCS cost pro-rated across aircraft force structure
 - Three separate cost estimates within \$ 0.5 M of each other
 - » Distinct corporate processes and databases enhance final creditability
- **75% Reduction in Operations & Support Cost (vs. F-16)**
 - Reductions achieved using conservative groundrules & assumptions
 - Minor variance in results among contractors
- **Order of Magnitude Reductions in Cost Per Target Killed**
 - Both Mission and Lifetime Cost per target killed
 - Based on results from Suppressor constructive analysis
- **Significant Reduction (>75%) in Peacekeeping Mission Cost**
 - Based on Thunder constructive analysis



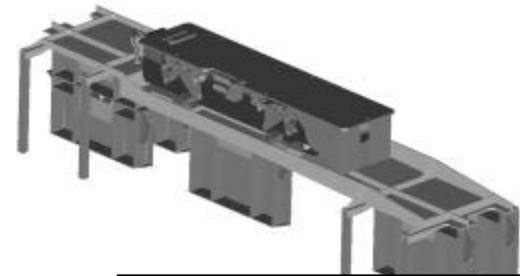
UCAV Operational System (UOS)



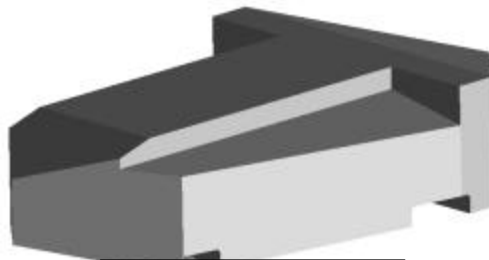
***UCAV Air
Vehicle***



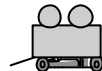
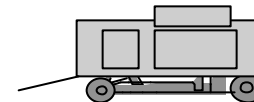
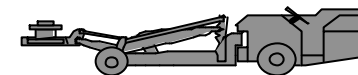
***MCS Shelters
& Work Stations***



Mission Magazines



***Air Vehicle
Container***



***Support
Equipment***

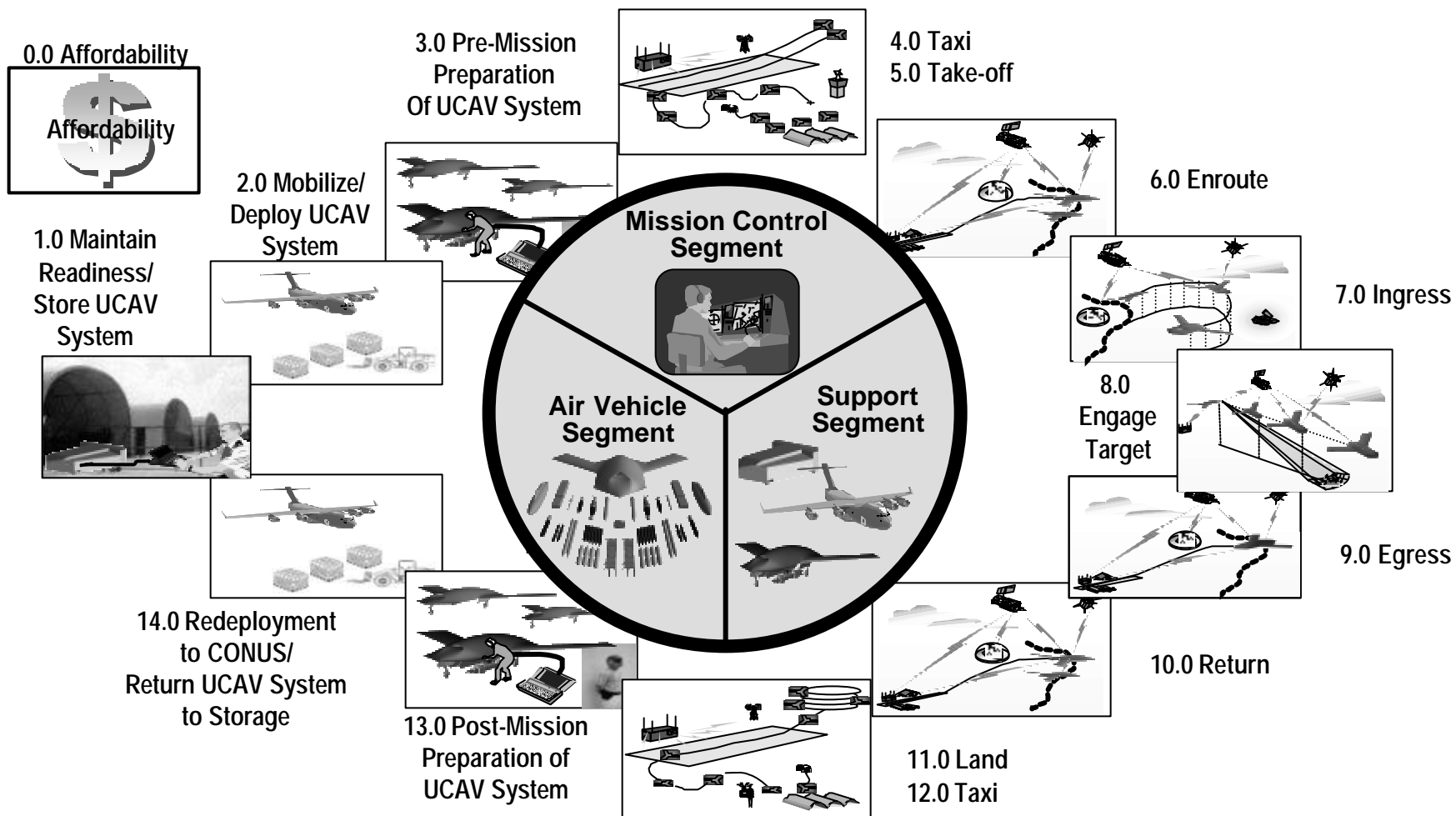
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UCAV Operational System (end to end system vision)



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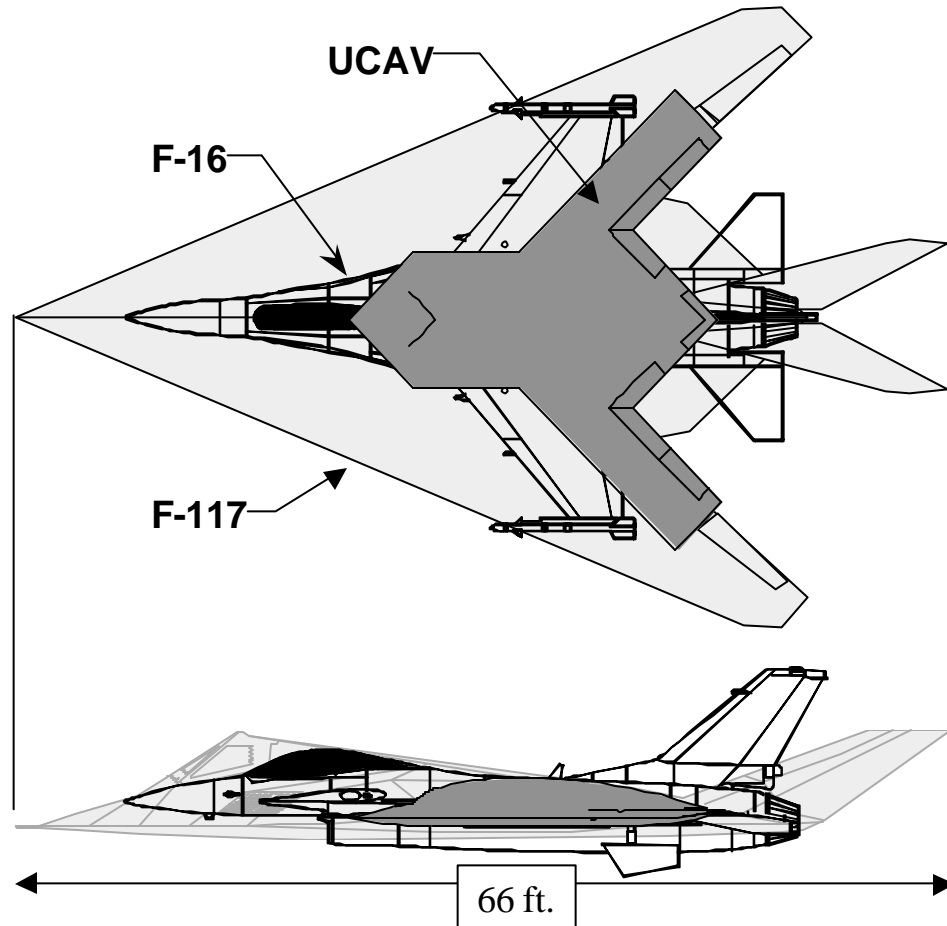


Air Vehicle Attributes



AIR VEHICLE

- ~15,000 / 7,500 lb Gross/Empty Weight
- High subsonic med/high altitude
- 500-1000 nmi mission radius
- 1000-3000 lb weapons payload
- Wide range of current & advanced weapons
- ESM & On-Board SAR Targeting Solution
- All electric
- Affordable Stealth to the Next Level



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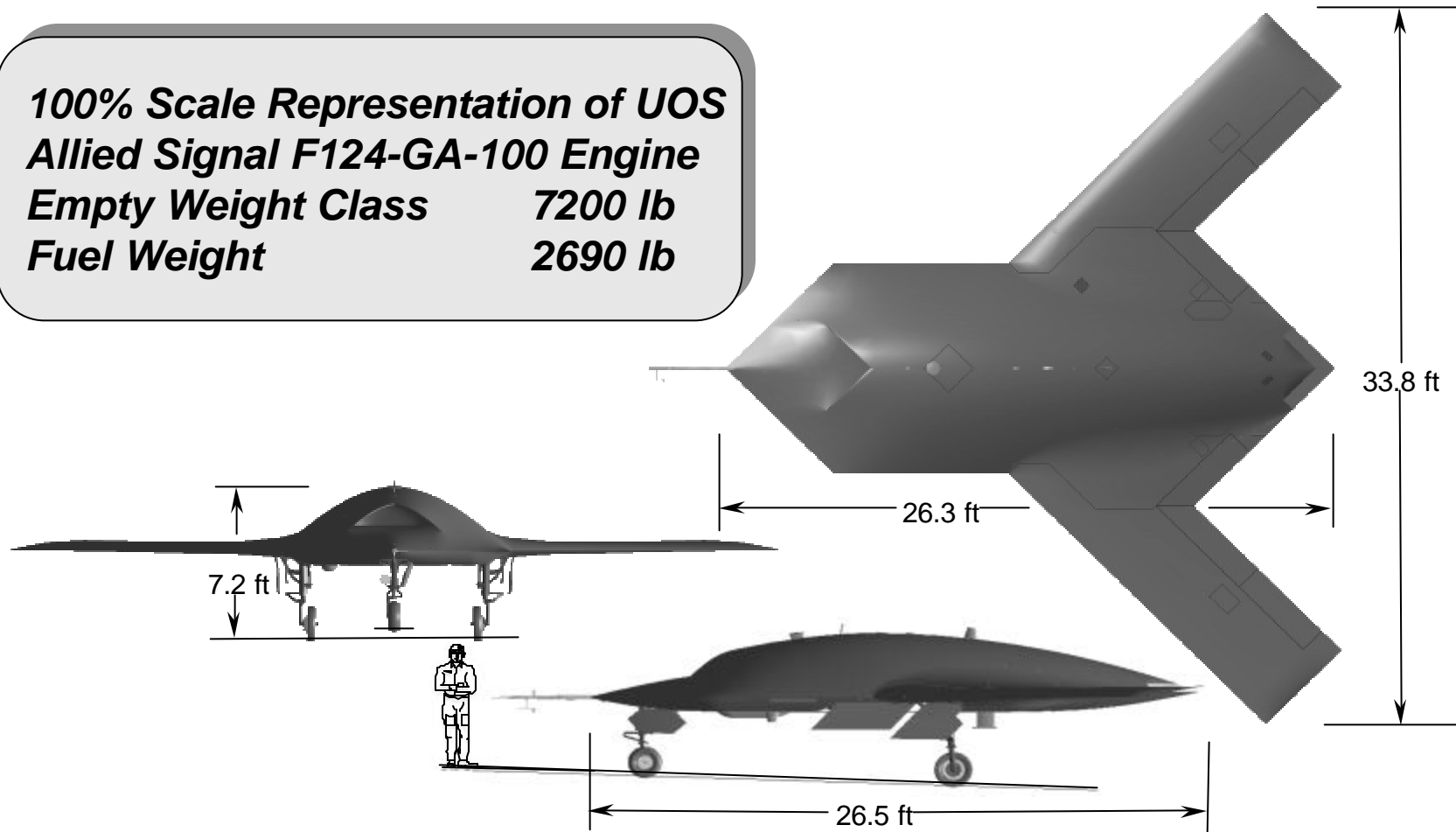

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UDS Air Vehicle



**100% Scale Representation of UOS
Allied Signal F124-GA-100 Engine**
Empty Weight Class 7200 lb
Fuel Weight 2690 lb



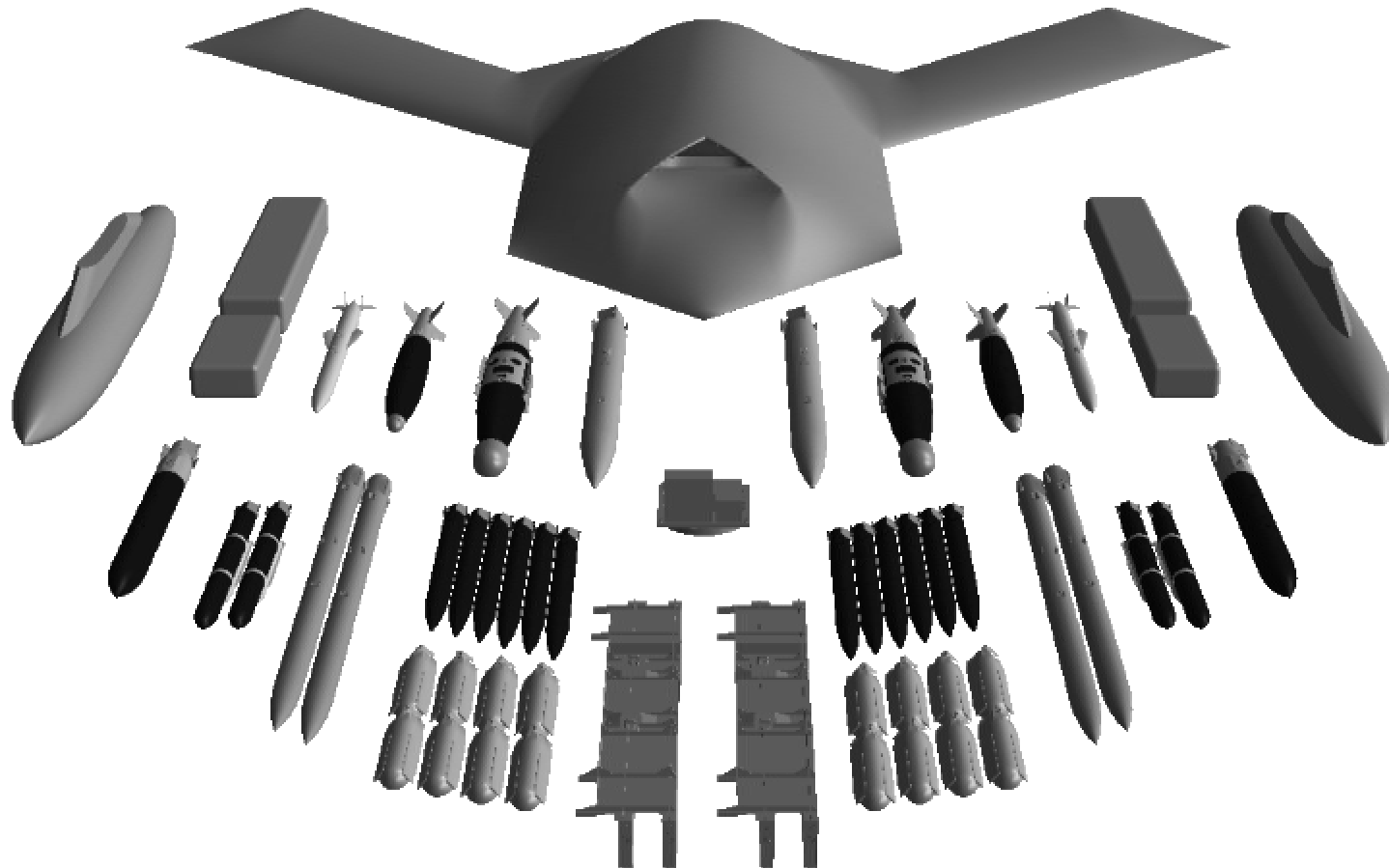
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UOS Payload Flexibility



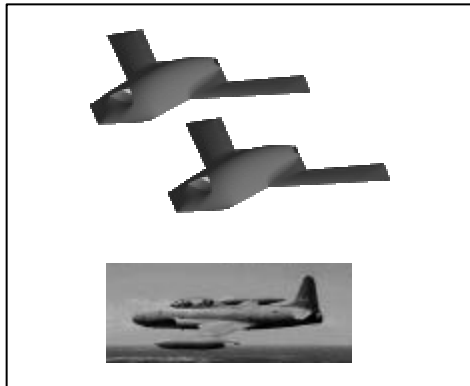
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Demonstrator System Overview



Air Vehicle Segment

- Two Full Scale Air Vehicles
- Surrogate Air Vehicle (T-33)
- Small Munitions
- Tactical Endurance SAR
- Radar Altimeter
- Nose Mount Camera
- T-RECS ESM Receiver
- All Electric



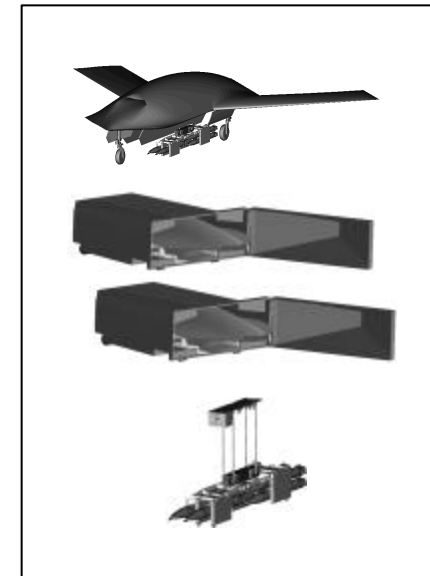
Mission Control Segment

- Flight Op Control
- Launch & Recovery Control
- LOS/SATCOM Link



System Simulation

- Multiple Air Vehicle Simulator
- SAR & CM Simulations



Support Segment

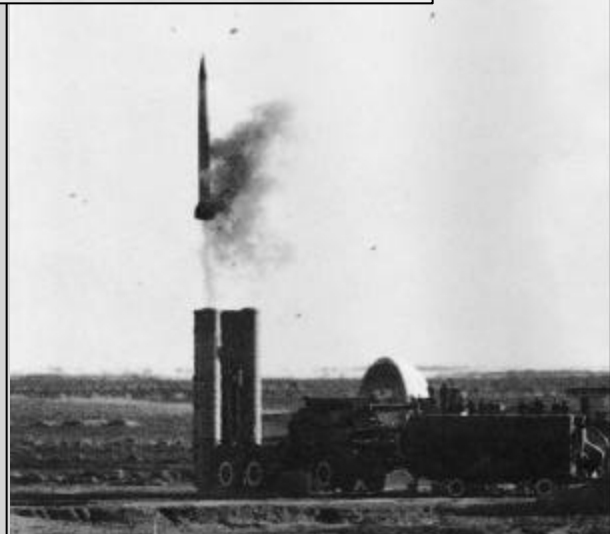
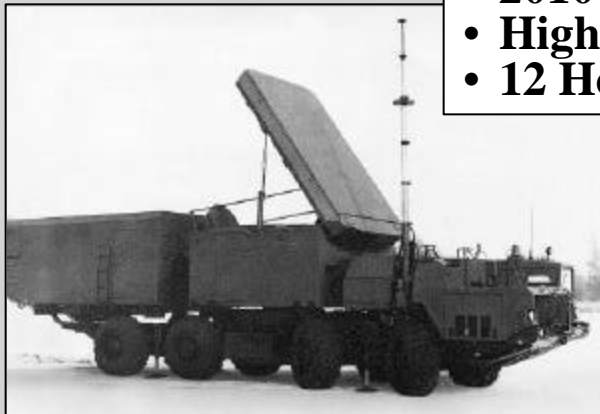
- Ground Handling & Support Equipment
- Full Scale Containers
- Multiple Bomb Rack
- Partial Mock-up for Load-Out & Wing Attach



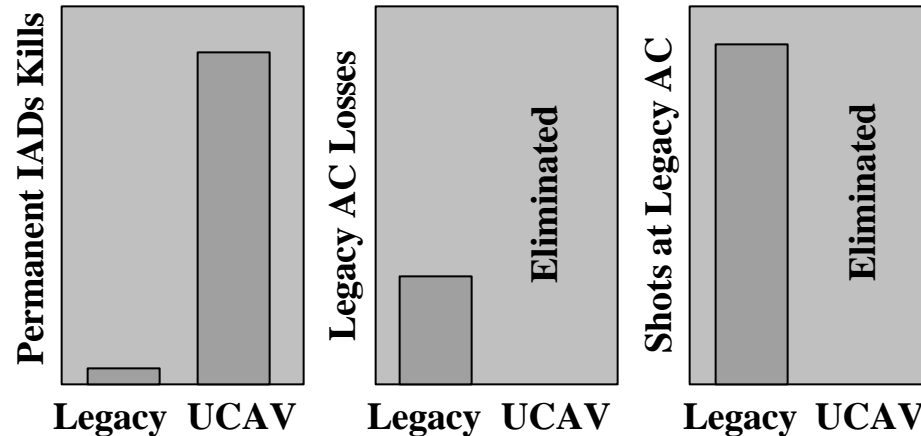
UCAV Cost Effectiveness in Lethal SEAD



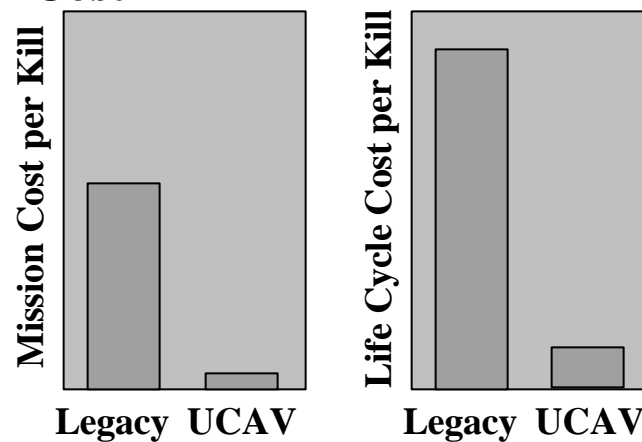
- 2010 Threat
- Highly Mobile
- 12 Hour Effort



• Effectiveness



• Cost



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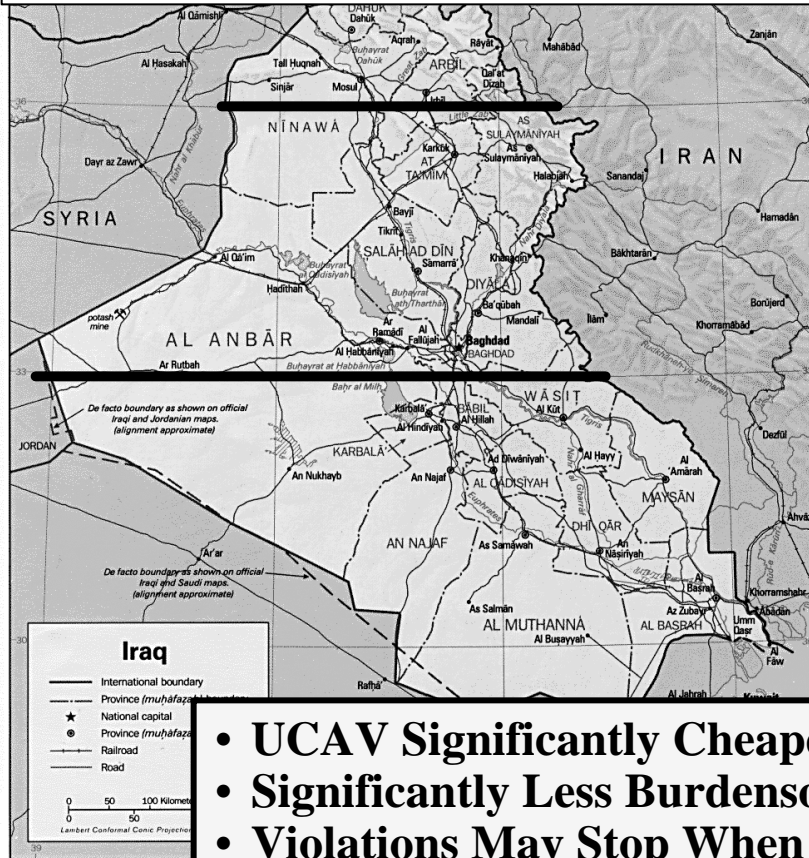




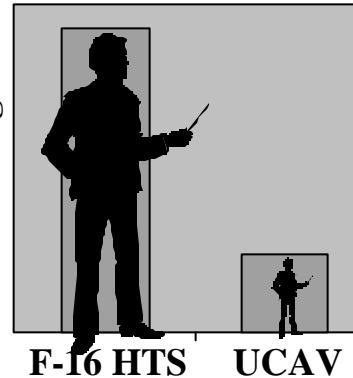
UCAV Cost Effectiveness in Peacekeeping



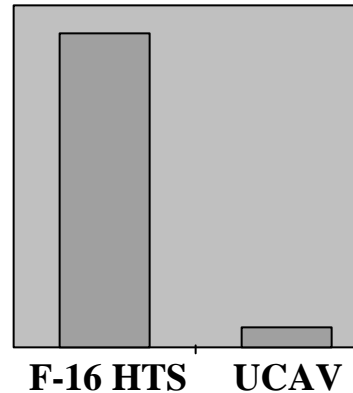
- No Fly Zone Enforcement
- 24 Hour, 7 Day per Week Operation



Manning



Cost



- UCAV Significantly Cheaper and More Effective
- Significantly Less Burdensome on USAF Personnel
- Violations May Stop When Man Removed from Threat

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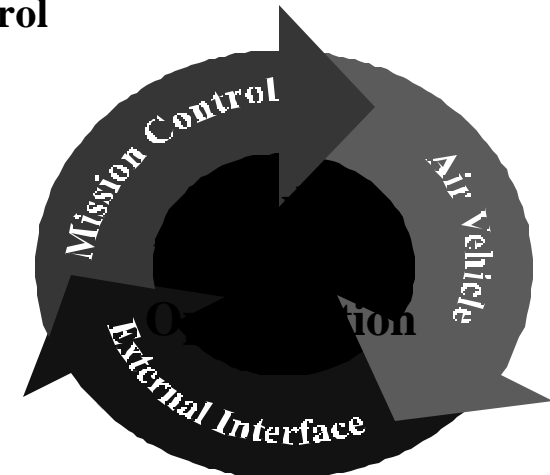
ATD Results



- **Demonstrated Technical Feasibility**
 - Command and Control
 - Robust, Dynamic Communications
 - Targeting & Weapons Authorization
 - Survivability in 2010 Threat Environment
- **Exploration of Design Space**
 - Human System Interface
 - Functional Allocation & Variable Autonomous Control
 - Onboard vs Offboard Information Architecture
- **UCAV Concepts of Operations**
 - Multi-UCAV Operations
 - Employment in System of Systems
 - Mixed Fleet Integration (Manned/Unmanned)
- **Validate Affordability Assumptions**
 - Acquisition Costs
 - Reduced Operations & Support Concepts

*Overall Assessment of System
Capabilities & Effectiveness
to Perform
2010 SEAD/Strike Mission*

To Answer One



You Must Address Them All



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